

Ace Instruments AI-DP1-1

Ace Instruments AI-DP1-1 Digital Differential Pressure Indicator/Controller User Manual

Model: AI-DP1-1 | Brand: Ace Instruments

Overview	Package Contents	Specifications	Setup	Operation	Applications	Maintenance
		Troubleshooting	Warranty & Support			

1. OVERVIEW

The Ace Instruments AI-DP1-1 is an advanced Digital Differential Pressure Indicator/Controller designed for precise measurement and monitoring of differential pressure in critical environments. It serves as an effective alternative to traditional Magnahelic gauges, offering a clear 4-digit LED display for easy readability. This device features an integrated sensor, a built-in buzzer alarm for process violations with an acknowledgment function, and the capability for unit conversion between mm.w.c. and Pascals. Its robust construction is suitable for modular wall fitment in clean rooms, and it includes RS485 Modbus communication for integration with BMS/SCADA/PLC systems.



Figure 1: Front view of the AI-DP1-1 Digital Differential Pressure Indicator, showing the 4-digit LED display and alarm acknowledgment button.

2. PACKAGE CONTENTS

Upon unpacking, please ensure all the following items are present:

- 1 x Ace Instruments AI-DP1-1 Digital Differential Pressure Indicator
- 1 x Pair of Wall-Mounted Hose Nipples (4mm, Stainless Steel)
- 1 x Power Adaptor (24 Volts D.C.)
- 1 x Instruction Manual (this document)
- 1 x Factory Calibration Certificate (with International Standards)

3. TECHNICAL SPECIFICATIONS

Feature	Specification
Measuring Range	-500 to +500 Pascals
Accuracy	±0.5% of Full Scale
Display	Integrated 4 Digit Red LED 7 Segment Display (0.8")
Maximum Over Pressure	2 Times the rated pressure
Sensors	Integrated High Speed Differential Pressure Sensor
Power Supply	24 Volts D.C. (Typical)
Alarms	Built-in High & Low Buzzer Alarm for Process Set Parameter Violation with Acknowledgment Key
Construction	M.S. Powder Coated Body with Stainless Steel Front Flush Plate
Communication	Isolated RS485 Modbus Protocol
Connections	2 x 4mm Stainless Steel Hose Nipples at the back
Medium	Air or Non-Corrosive Gases
Dimensions (W×H×D)	100 × 90 × 30 mm (Instrument Enclosure)
Unit Selection	Factory Fixed Selection for mm.W.C / Pascals
Item Weight	500 g

4. SETUP AND INSTALLATION

The AI-DP1-1 is designed for modular wall fitment, typically in clean room environments. Follow these steps for proper installation:

- Mounting:** The instrument features an M.S. powder-coated body with a stainless steel front flush plate. It is designed for secure integration into a wall panel. Ensure adequate space and proper ventilation around the unit.
- Pressure Connections:** Locate the two 4mm stainless steel hose nipples at the back of the unit. Connect appropriate tubing from your pressure source to these nipples. Ensure connections are secure and leak-free. The device measures differential pressure between these two points.
- Power Connection:** Connect the provided 24 Volts D.C. power adaptor to the instrument's power input. Ensure the power source is stable and matches the specified voltage.
- RS485 Modbus Communication (Optional):** For integration with Building Management Systems (BMS), SCADA, or PLC, connect the RS485 communication lines to the designated terminals. Refer to the Modbus communication protocol documentation for detailed wiring and configuration.



Figure 2: Rear view of the AI-DP1-1, illustrating the 4mm stainless steel hose nipples for pressure connections and power input.

Important: This device is intended for use with air or non-corrosive gases only. Do not connect to corrosive media or liquids.

5. OPERATION

Once powered on, the AI-DP1-1 will display the current differential pressure reading on its 4-digit red LED display.

- **Reading Display:** The display shows the differential pressure in the factory-fixed unit (either mm.W.C or Pascals).
- **Alarm Functionality:** The device includes built-in high and low buzzer alarms. If the measured differential pressure exceeds or falls below the pre-set thresholds, the buzzer will activate, and an alarm indicator may illuminate.
- **Alarm Acknowledgment:** To silence the buzzer and acknowledge a process violation, press the "ALM ACK" button located on the front panel. Acknowledging the alarm does not clear the underlying condition; it only silences the audible alert. The alarm indicator will remain active until the pressure returns to within the acceptable range.
- **Unit Conversion:** The unit selection (mm.W.C or Pascals) is factory-fixed. There is no user-selectable unit

conversion option on this model.

- **Balance Arrangement:** The device incorporates a balance arrangement to meet audit requirements, ensuring stable and accurate readings.

6. APPLICATIONS

The Ace Instruments AI-DP1-1 is suitable for a wide range of critical environments requiring precise differential pressure monitoring and control. Typical applications include:

- Infection Rooms
- Hospital Operation Theatre (OT) rooms
- Isolation Rooms
- Laminar Air Flow Cabinets
- Pharmaceutical Clean Rooms
- HVAC Systems
- Bio Safety Cabinets
- Air Handling Units (AHUs)
- Research & Development (R&D) Laboratories



Figure 3: Visual representation of typical environments where the AI-DP1-1 is utilized, such as clean rooms, HVAC systems, and bio safety cabinets.

7. MAINTENANCE

To ensure the longevity and accurate performance of your AI-DP1-1 Differential Pressure Indicator, follow these maintenance guidelines:

- **Cleaning:** Regularly wipe the front panel with a soft, damp cloth. Avoid using abrasive cleaners or solvents that could damage the display or finish.
- **Calibration:** Although the device comes with a factory calibration certificate, periodic re-calibration is recommended to maintain accuracy, especially in critical applications. Refer to local regulations and industry standards for calibration intervals.
- **Connection Integrity:** Periodically inspect the hose nipples and tubing for any signs of wear, cracks, or leaks. Ensure all connections remain secure.
- **Environmental Conditions:** Operate the device within its specified environmental limits. Avoid exposure to extreme

temperatures, humidity, or corrosive atmospheres.

8. TROUBLESHOOTING

If you encounter issues with your AI-DP1-1, refer to the following common troubleshooting steps:

- **No Display/Power:**

- Check if the power adaptor is securely connected to both the device and a working power outlet.
- Verify that the power supply is providing the correct 24 Volts D.C.

- **Incorrect Readings:**

- Ensure the pressure connections (hose nipples) are correctly installed and free from leaks or blockages.
- Verify that the medium being measured is air or a non-corrosive gas, as specified.
- Consider if re-calibration is due, especially if the device has been in service for an extended period.

- **Alarm Constantly Active:**

- Check the actual differential pressure in the environment. The alarm indicates a genuine deviation from set parameters.
- If the pressure is within limits but the alarm persists, there might be an issue with the sensor or alarm settings.
- Press the "ALM ACK" button to silence the buzzer, but investigate the root cause of the pressure deviation.

- **Communication Issues (RS485):**

- Verify wiring connections for the RS485 Modbus.
- Check Modbus address and baud rate settings on both the device and the connected BMS/SCADA/PLC system.

If these steps do not resolve the issue, please contact Ace Instruments customer support for further assistance.

9. WARRANTY AND SUPPORT

Warranty: The Ace Instruments AI-DP1-1 Digital Differential Pressure Indicator/Controller comes with a **12-month warranty** from the date of purchase, covering manufacturing defects and malfunctions under normal operating conditions. Please retain your purchase receipt and calibration certificate for warranty claims.

Calibration Certificate: Each unit is supplied with a Factory Calibration Certificate, ensuring its accuracy and compliance with international standards at the time of dispatch.

Customer Support: For technical assistance, troubleshooting, or warranty inquiries, please contact Ace Instruments directly.

Manufacturer/Packer Contact:

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Ask about setup, troubleshooting, compatibility, parts, safety, or missing instructions. Manuals+ will review the question and use this page's manual context to help answer it.

Name

Anonymous

Email

you@example.com

After a successful submission, we securely hash the supplied account or form email before sending it to Microsoft Advertising for conversion attribution. [Privacy details](#).

Question

Example: How do I reset this device or fix this error?

Details

Model number, symptoms, what you tried, or the section of the manual you are using.

Submit question